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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,533	01/16/2002	Joel A. Kubby	111014	7731
27074	7590	04/29/2004	EXAMINER	
OLIFF & BERRIDGE, PLC. P.O. BOX 19928 ALEXANDRIA, VA 22320			COLEMAN, WILLIAM D	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 04/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,533

Applicant(s)

KUBBY, JOEL A.

Examiner

W. David Coleman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see interview summary, filed January 29, 2004, with respect to the rejection(s) of claim(s) 7-10, 12-17, 19 and 20 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kano et al., U.S. Patent 5,587,343.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7, 8, 9, 10, 12, 13, 21, 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kano et al., U.S. Patent 5,587,343.

3. Kano discloses a semiconductor process as claimed. See **FIGS. 1-34** where Kano teaches the claimed invention.

4. Pertaining to claims 7 and 21, Kano teaches a method for fabricating a micro-machined device, comprising:

forming a substrate **1**;

forming an insulation layer **2** over at least part of the substrate;

forming a silicon layer **4** over at least part of the insulation layer;

forming a silicon structure in the silicon layer;

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and forming a gap 3 (as seen in **FIG. 2**) in the insulation layer that at least partially thermally isolates the silicon structure from the substrate, wherein a surface of the substrate under the gap in the insulation layer is maintained substantially un-etched and the gap in the resulting, Micro-machined device remains at least partially open.

5. Pertaining to claim 8, Kano teaches the method of claim 7, wherein forming the gap in the insulation layer comprises removing a portion of the insulation layer with an etch that does not affect the substrate.

6. Pertaining to claim 9, Kano teaches the method of claim 8, wherein forming the substrate comprises forming a silicon substrate and removing the portion of the insulation layer is with an etch that does not affect silicon.

7. Pertaining to claim 10, Kano teaches the method of claim 7, wherein forming the substrate comprises forming a substrate of a first material, forming the insulation layer comprises forming a layer of a second material, and forming the gap in the insulation layer comprises removing a portion of the insulation layer with an etch that is highly selective between the first and second materials.

8. Pertaining to claims 12 and 22, Kano teaches the method of claim 7, wherein forming the, substrate comprises forming a substrate of silicon, forming the insulation layer comprises forming a layer of a dielectric material, and forming the gap in the insulation layer comprises

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removing a portion of the insulation layer with an etch that is highly selective between the dielectric material and silicon.

9. Pertaining to claims 13 and 24, Kano teaches the method of claim 7, wherein forming the substrate comprises forming a substrate of silicon, forming the insulation layer, comprises forming a layer of silicon dioxide, and forming the gap in the insulation layer, comprises removing a portion of the insulation layer with an etch that is highly selective between silicon dioxide and silicon.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14, 15, 16, 17, 18, 19, 20 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano et al., U.S. Patent 5,587,343 in view of Islam et al., U.S. Patent 6,407,851 B1.

Kano discloses a semiconductor process substantially as claimed.

10. Pertaining to claims 14 and 25, Kano fails to teach a method for fabricating a thermal-optical switch, comprising:

Kano teaches,

forming a substrate;

forming an insulation layer over at least part of the substrate;

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forming a silicon layer over at least part of the insulation layer;

forming a silicon structure in the silicon layer; and forming a gap in the insulation layer without affecting a surface of the substrate underlying the gap. However, Kano fails to teach wherein the gap of the resulting thermo-optical switch remains at least partially open. Islam teaches a thermo-optical switch. See FIGS. 1A-9 of Islam, where a thermo-optical switch is produced. In view of Islam, it would have been obvious to one of ordinary skill in the art to incorporate the thermo-optical switch of Islam into the Kano semiconductor process because the movable mirror may comprise polysilicon doped with a sufficient amount to render it substantially conductive (column 6, lines 62-65).

11. Pertaining to claim 15, Kano teaches the method of claim 14, wherein forming the gap in the insulation layer comprises removing a portion of the insulation layer with an etch that does not affect the surface of the substrate underlying the gap.

12. Pertaining to claim 16, Kano teaches the method of claim 14, wherein forming the substrate comprises forming a silicon substrate and removing the portion of the insulation layer is with an etch that does not affect silicon.

13. Pertaining to claim 17, Kano teaches the method of claim 14, wherein forming the substrate comprises forming a substrate of a first material, forming the insulation layer comprises forming a layer of a second material, and forming the gap in the insulation layer comprises removing a portion of the insulation layer with an etch that is highly selective between the first and second materials.

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14. Pertaining to claim 19, Kano teaches the method of claim 14, wherein forming the substrate comprises forming a substrate of silicon, forming the insulation layer comprises forming a layer of a dielectric material, and forming the gap in the insulation layer comprises removing a portion of the insulation layer with an etch that is highly selective between the dielectric material and silicon.

15. Pertaining to claim 20, Kano teaches the method of claim 14, wherein forming the substrate comprises forming a substrate of silicon, forming the insulation layer comprises forming a layer of silicon dioxide, and forming the gap in the insulation layer comprises removing a portion of the insulation layer with an etch that is highly selective between silicon dioxide and silicon.

16. Claims 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano, U.S. Patent 5,587,343 in view of Islam et al., U.S. Patent 6,407,851 B1.

17. Pertaining to claims 11 and 18, Kano discloses a semiconductor process substantially as claimed. However, Kano fails to the method of claims 7 and 17, wherein removing a portion of the insulation layer with an etch that is highly selective between the first and second materials comprises removing a portion of the insulation layer with air etch having a selectivity of about 20:1 or greater.

18. Given the teaching of the references, it would have been obvious to determine the optimum thickness, temperature as well as condition of delivery of the layers involved. See *In re Aller, Lacey and Hall* (10 USPQ 233-237) "It is not inventive to discover optimum or workable

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ranges by routine experimentation. Note that the specification contains no disclosure of either the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 f.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

Objections

19. The Examiner also objects to claims 22-26 since they depend on cancelled claims.

Conclusion

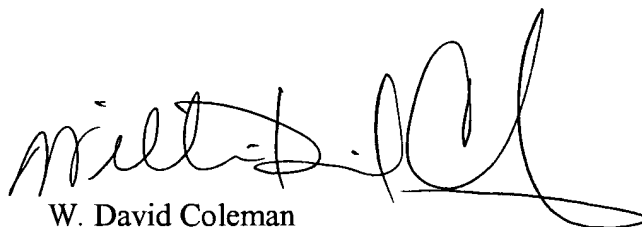
20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856.

The examiner can normally be reached on 9:00 AM-5:00 PM.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'W. David Coleman', with a stylized flourish extending to the right.

W. David Coleman
Primary Examiner
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WDC